

REMARKS

Applicant provides the present Preliminary Amendment, *inter alia*, to assure compliance with 37 C.F.R. § 1.607(c) and the further distinguish the claims from the claims of United States Patent No. 6,534,857 to Morse (hereinafter "Morse"). Applicant does not understand § 1.607(c) to necessarily apply in the present circumstances as Applicant did not copy the claims of the present application from another patent. Nonetheless, out of an abundance of caution and so that the Examiner can make his/her own determination, Applicant wishes to bring to the attention of the Examiner the claims of the Morse patent.

Applicant has cancelled Claim 9 and has amended Claim 8. In particular, Claim 8 has been amended to recite that the pitch is inversely proportional to the distance from the center of the device. This amendment is to aid in understanding the distinction between the claims of the present application and the claims of Morse and is not for the purpose of distinguishing over prior art.

Applicants note that Claim 1 of the present application differs in scope from Claim 1 of Morse in that Claim 1 of Morse recites "a plurality of like elemental semiconductor devices, having first and second current conducting terminals and a control terminal, aligned side-by-side in a common semiconductor chip" and "the control terminals are connected in parallel" whereas Claim 1 of the present application recites "a plurality of unit cells connected in parallel, the unit cells each having a gate finger." Furthermore, Claim 1 of Morse recites "the mutual separation between immediately adjacent control terminals is varied in a predetermined manner from a central region of the semiconductor chip to opposing outer end regions thereof" whereas Claim 1 of the present application recites "a pitch between the gate fingers is varied in a predetermined pattern between the gate fingers so as to provide a non-uniform pitch between the gate fingers." Thus, Applicant submits that the scope of Claim 1 of the present application differs from that of Claim 1 of Morse.

Likewise, Applicants submit that the scope of Claim 1 of the present application differs from the scope of the claims that depend from Claim 1 of Morse. For example, while Claim 4 of Morse recites that the controlling terminal is a gate terminal, Claim 4 does not address the recitations of Claim 1 of Morse that "the mutual separation between immediately adjacent control terminals is varied in a predetermined manner from a central region of the semiconductor chip to opposing outer end regions thereof" in contrast with the recitation of Claim 1 of the present application that "a pitch between the gate fingers is varied in a

predetermined pattern between the gate fingers so as to provide a non-uniform pitch between the gate fingers."

Claim 10 of Morse recites "a thermally balanced power transistor structure, comprising a plurality of field effect transistor devices fabricated in a common semiconductor chip, each field effect transistor device having a source, a drain and a gate electrode and wherein the gate electrodes comprise elongated finger elements connected in parallel and having a variable pitch between adjacent fingers so as to provide a substantially uniform temperature in the semiconductor chip." Thus, Applicants also submit that the scope of Claim 1 differs from that of Claim 10 of Morse. Likewise, Applicants submit that the scope of Claim 1 of the present application differs from the scope of the claims of Morse that depend from Claim 10 of Morse.

Claim 16 of Morse recites "a thermally balanced power field effect transistor structure, comprising: a plurality of field effect transistor devices fabricated side-by-side in a common semiconductor chip, each field effect transistor device having a source, a drain and a gate electrode and wherein the gate electrodes comprise elongated finger elements of like dimensions arranged in parallel and connected in parallel and having a pitch which varies uniformly or non-uniformly from a relatively large pitch in the control region of the chip to a relatively small pitch at the outer end regions thereof so as to provide a substantially uniform temperature in the semiconductor chip." Applicants submit that the scope of Claim 1 of the present application differs from the scope of the claims that depend from Claim 16 of Morse.

Claim 2 of the present application recites that "the predetermined pattern of non-uniform pitch between the gate fingers provides a substantially uniform junction temperature to a substantial majority of the gate fingers when in operation." In contrast, Claims 1 through 9 of Morse do not discuss junction temperature and Claims 10 through 16 of Morse recite that "a substantially uniform temperature in the semiconductor chip." Thus, Applicant submits that Claim 2 of the present application also differs in scope from the claims of Morse.

Claim 3 of the present application recites that "the predetermined pattern of non-uniform pitch between the gate fingers provides a lower peak junction temperature than a corresponding uniform gate pitch device for a particular set of operating conditions." None of the claims of Morse discuss the peak junction temperature in comparison to that of a uniform gate pitch device. Thus, Applicant submits that Claim 3 of the present application also differs in scope from the claims of Morse.

Claim 4 of the present application recites that "the predetermined pattern of non-uniform pitch between the gate fingers provides a substantially uniform junction temperature to all but the outermost gate fingers of the device when in operation." None of the claims of Morse discuss a difference between the junction temperature of the outermost gate fingers in comparison to the other gate fingers. Thus, Applicant submits that Claim 4 of the present application also differs in scope from the claims of Morse.

Claim 5 of the present application recites that "the unit cells comprise a plurality of unit cells arranged in a linear array." While Claims 1 and 16 of Morse recites that the devices or transistors are "side-by-side," Applicant submits that the other recitations of Claim 1, from which Claim 5 depends, provide a different scope than the recitations of Claims 1 and 16 of Morse.

Claims 6 and 7 of the present application recite that the unit cells are arranged "in a two dimensional array." None of the claims of Morse recite a two dimensional array. Accordingly, Applicant submits Claims 6 and 7 of the present application differ in scope from the claims of Morse.

Claim 8 of present application has been amended to recite that "the pitch between that gate fingers is inversely proportional to a distance of the gate finger from a center of the device." While Claim 6 of Morse recites that "the pitch between the fingers decreases from the central region of the semiconductor chip to the outer ends thereof," Claim 8 of Morse recites that the pitch decreases uniformly and Claim 9 of Morse recites that the pitch decreases non-uniformly, these claims do not recite that the relationship of gate pitch inversely proportional to the distance of the gate finger from the center of the device as recited in Claim 8 of the present application. Accordingly, Applicant submits that Claim 8 of the present application differs in scope from the claims of Morse.

Applicant has cancelled Claim 9 of the present application to further distinguish the claims of the present application from the claims of Morse.

Claim 10 of the present application recites that "the unit cells comprise MESFET unit cells" and Claim 11 of the present application recites that "the unit cells comprise silicon carbide semiconductor device unit cells or gallium nitride semiconductor device unit cells." Applicant submits that no such corresponding recitations are found in the claims of Morse. Accordingly, Applicant submits that Claims 10 and 11 of the present application differ in scope from the claims of Morse.

Claim 12 of the present application recites that "the predetermined pattern of non-uniform pitch between the gate fingers provides a more uniform junction temperature than a corresponding uniform gate pitch device for a particular set of operating conditions." As discussed above, Claims 1 through 9 of Morse do not discuss temperature and Claims 10 through 16 of Morse recite that "a substantially uniform temperature in the semiconductor chip." Thus, Applicant submits that Claim 12 of the present application also differs in scope from the claims of Morse.

Claim 13 of the present application recites that "the junction temperature does not differ by more than about 5 °C over at least 80% of the plurality of unit cells" and Claim 14 of the present application recites that "the junction temperature does not differ by more than about 5 °C over at least 95% of the plurality of unit cells." Applicant submits that no such corresponding recitations are found in the claims of Morse. Accordingly, Applicant submits that Claims 13 and 14 of the present application differ in scope from the claims of Morse.

Independent Claim 15 and Claims 16 through 20 of the present application all recite that "the non-uniform spacing between the gates is provided in a pattern that provides a lower peak junction temperature than a corresponding uniform gate pitch device for a particular set of operating conditions." Thus, these claims differ in scope from the claims of Morse for reasons analogous to those discussed above with reference to Claim 3.

Claims 21 through 24 of the present application are method claims and Morse does not include method claims. Thus, Applicant submits that Claims 21 through 24 of the present application differ in scope from the claims of Morse.

Claim 25 of the present application recites "means for providing a substantially uniform junction temperature to a substantial majority of the gate fingers when in operation." Accordingly, Claim 25 of the present application differs in scope from the claims of Morse for reasons analogous to those discussed above with reference to Claim 3. Furthermore, Applicant submits that the means-plus-function format provides further grounds for distinguishing the scope of Claim 25 from the claims of Morse.

Claim 26 of the present application recites that "the means for providing provides a junction temperature does not differ by more than about 5 °C over at least 80% of the plurality of unit cells" and Claim 27 of the present application recites that "the means for providing provides a junction temperature does not differ by more than about 5 °C over at least 95% of the plurality of unit cells." Applicant submits that no such corresponding

recitations are found in the claims of Morse. Accordingly, Applicant submits that Claims 26 and 27 of the present application differ in scope from the claims of Morse.

CONCLUSION

If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

It is not believed that an extension of time and/or additional fee(s), including fees for net addition of claims, are required, beyond those that may otherwise be provided for in documents accompanying this paper. In the event, however, that an extension of time is necessary to allow consideration of this paper, such an extension is hereby petitioned under 37 C.F.R. §1.136(a). Any additional fees believed to be due in connection with this paper may be charged to our Deposit Account No. 50-0220.

Respectfully submitted,



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